

In the Claims

The following Listing of Claims replaces all prior versions in the application:

LISTING OF CLAIMS

1. (Currently amended) An apparatus comprising:
an IP wrapper circuit;
a packet switch;
one or more cherrypicker multiplexers; and
a local area network coupling said IP wrapper to said packet switch and coupling said packet switch to said one or more cherrypicker multiplexers,
wherein said cherrypicker multiplexers and said packet switch cooperate to receive data indicating video programs to be transmitted downstream to customers over DSL lines, cable television hybrid fiber coaxial cable networks or satellite downlinks and to receive MPEG data encapsulated in IP packet which are encapsulated in local area network packets from said IP wrapper circuit and to pick out only the MPEG packets containing data encoding the video programs which are to be transmitted and assemble said MPEG packets into MPEG transport streams.

2. (Currently amended) The apparatus of Claim 1 An apparatus comprising:
an IP wrapper circuit;
a packet switch;
one or more cherrypicker multiplexers; and
a local area network coupling said IP wrapper to said packet switch and coupling said packet switch to said one or more cherrypicker multiplexers,
wherein said cherrypicker multiplexers and said packet switch cooperate to receive data indicating video programs to be transmitted downstream to customers over DSL lines, cable

television hybrid fiber coaxial cable networks or satellite downlinks and to receive MPEG data encapsulated in IP packet which are encapsulated in local area network packets from said IP wrapper circuit and to pick out only the MPEG packets containing data encoding the video programs which are to be transmitted and assemble said MPEG packets into MPEG transport streams, and wherein said cherrypicker multiplexers further comprise circuitry to adjust the bandwidth of the MPEG transport streams so generated to match the available bandwidth to transport or process the data of said program(s).

3. (Previously presented) An apparatus comprising:
 - one or more video servers that output MPEG transport streams;
 - one or more satellite feeds that output MPEG transport streams;
 - an IP wrapper circuit coupled to said one or more video servers and said one or more satellite feeds;
 - a packet switch;
 - one or more cherrypicker multiplexers; and
 - a local area network coupling said IP wrapper circuit to said packet switch and coupling packet switch to said one or more cherrypicker multiplexers;
 - means for receiving upstream requests for video-on-demand programs and sending data to said cherrypicker multiplexers which identify the requested programs; and
 - means for sending data to said one or more video servers or satellite feeds or both said video servers or satellite feeds identifying which video program data should be sent to said cherrypicker multiplexers through said IP wrapper circuit, said local area network and said packet switch for assembly into MPEG transport streams for transmission to customers which made said upstream requests.

4. (Previously presented) An apparatus comprising:
 - one or more video servers that output MPEG transport streams;
 - one or more satellite feeds that output MPEG transport streams;
 - one or more web servers;

any one or more other types of servers on which applications programs may be run remotely from customer sites;

an IP wrapper circuit coupled to said one or more video servers and said one or more satellite feeds;

a packet switch coupled to said one or more web servers and said any one or more other types of servers;

one or more cherrypicker multiplexers;

a local area network coupling said IP wrapper to said packet switch and coupling said packet switch to said one or more cherrypicker multiplexers ; and

upstream channel means for receiving upstream requests from customers for video programs and requests or commands to obtain data from the Internet via said web server or execute application programs on said other servers, and for identifying the requested video programs to the appropriate one or more of said video servers or satellite feeds or both and to send said request for data and commands to one or more web server or any other types of server which can supply said and wherein said requested data or execute said command;

and wherein said IP wrapper circuit and said packet switch cooperate to packetize said requested video program data appropriately and route said packetized video data and other requested data output by said one or more web servers and said any one or more other types of servers to the appropriate one or more means for transmission to the one or more customers who requested said data.

5. (Original) The apparatus of claim 4 wherein said cherrypicker multiplexers further comprise means for adjusting the bandwidth of data to be sent to customers to lesser bandwidths if necessary.

6. (Previously presented) An apparatus comprising:

an IP wrapper circuit for receiving MPEG transport streams on one or more inputs, each said MPEG transport stream comprised of a plurality of MPEG packets, each MPEG packet having a program identification code (hereafter a PID) and mapping said PIDs and input number for each MPEG packet in each said transport stream into an IP packet header multicast

destination address and encapsulating one or more of said MPEG packets having the same PID and input number into an IP packet and encapsulating each IP packet into a LAN packet having an LAN packet destination address which is a multicast address but which is unique to the PID and input number of the MPEG packets enclosed therein;

a local area network coupled to said IP wrapper circuit;

a packet switch coupled to said IP wrapper circuit via said local area network;

one or more cherrypicker multiplexers coupled to said packet switch via said local area network, each functioning to receive data defining which programs have been requested by one or more customers or which is to be transmitted regardless of requests for it and generating and transmitting to said packet switch one or more packets identifying by LAN packet destination address the LAN packets said packet switch is to route to said cherrypicker multiplexer, and for receiving from said packet switch the requested LAN packets encapsulating MPEG data and assembling MPEG transport streams that are to be sent to said customers containing data encoding the programs which have been requested or which are to be transmitted regardless of request, and encapsulating MPEG packets from said transport streams into UDP/IP or TCP/IP packets.

7. (Original) The apparatus of claim 6 further comprising an IP dewrapper circuit coupled to said cherrypicker through said packet switch and said local area network and functioning to receive LAN packets encapsulating UDP/IP or TCP/IP packets which encapsulate at least MPEG packet data and which are addressed to said IP dewrapper circuit said IP dewrapper circuit functioning to strip off the LAN packet header and UDP/IP or TCP/IP packet header and output a pure MPEG transport stream, and wherein said cherrypicker multiplexers function to encapsulate the UDP/IP or TCP/IP packets they generate in LAN packets addressed to said IP dewrapper circuit and transmit them over said local area network to said packet switch.

8. (Previously presented) The apparatus of claim 6 further comprising dedicated data paths from each said cherrypicker multiplexer to one or more DSL modems or cable modems or satellite uplink facilities,

9. (Previously presented) The apparatus of claim 6 further comprising a second local or wide area network of a different type than the type of local area network coupled to said packet switch, said second local or wide area network, coupling said cherrypicker multiplexers to one or more DSL modems or cable modems or satellite uplink facilities.
10. (Original) The apparatus of claim 6 further comprising means for receiving upstream requests for video-on-demand programs or other TCP/IP packetized data from the internet or other sources and for transmitting those requests to said cherrypicker multiplexers.
11. (Original) The apparatus of claim 10 wherein said cherrypicker multiplexers convert said requests to particular PIDs and input number, and generate and send to said packet switch LAN packets identifying the particular LAN packets by LAN destination address which will carry the data requested in the upstream request.
12. (Original) The apparatus of claim 11 wherein said packet switch further functions to receive said LAN packets identifying LAN packets to be routed to said cherrypicker multiplexers and generates and sends messages to the appropriate source of the requested data requesting that the requested data be sent to said packet switch.
13. (Original) The apparatus of claim 6 further comprising a web server coupled to the internet and a local area network connection between said mob server and said packet switch.
14. (Previously presented) The apparatus of claim 6 further comprising a wide area network data path between said packet switch and one or more other cable system headends or DSL central offices or satellite uplink facilities such that requested data may be received from said one or more other cable system headends or DSL central offices or satellite uplink facilities.
15. (Previously presented) An apparatus comprising:

one or more video servers or satellite uplink/downlink circuitry or both that output MPEG transport streams encoding one or more video programs, each MPEG transport stream comprised of a plurality of MPEG packets each having a program identification code (hereafter PID);

an IP wrapper circuit for receiving MPEG transport streams on one or more inputs coupled to said one or more video servers or satellite receivers or both said video servers and satellite receivers, and mapping said PIDs and input number for each MPEG packet in each said transport stream into an IP packet header multicast destination address and encapsulating one or more of said MPEG packets having the same PID and input number into an IP packet and encapsulating each IP packet into a LAN packet having an LAN packet destination address which is a multicast address but which is unique to the PID and input number of the MPEG packets enclosed therein;

a local area network coupled to said IP wrapper circuit;

a packet switch coupled to said IP wrapper circuit via said local area network;

one or more cherrypicker multiplexers coupled to said packet switch via said local area network, each functioning to receive data defining which programs have been requested by one or more customers or which is to be transmitted regardless of requests for it and generating and transmitting to said packet switch one or more packets identifying by LAN packet destination address the LAN packets said packet switch is to route to said cherrypicker multiplexer, and for receiving from said packet switch the requested LAN packets encapsulating MPEG data and assembling MPEG transport streams that are to be sent to said customers containing data encoding the programs which have been requested or which are to be transmitted regardless of request, and encapsulating MPEG packets from said transport streams into UDP/IP or TCP/IP addressed either packets to a host computer and a process on said host computer at a customer site to which said data is to be sent or addressed to an IP dewrapper circuit coupled by said local area network to said packet switch and which does not form part of the invention of this claim;

means for receiving upstream requests for video-on-demand programs or other TCP/IP packetized data from the internet or other sources and for transmitting those requests to said cherrypicker multiplexers;

and wherein said cherrypicker multiplexers convert said upstream requests to particular PIDs and input numbers, and generate and send to said packet switch LAN packets or other

messages identifying the particular LAN packets to be routed to each said cherrypicker multiplexer by LAN destination address, said LAN packet to be routed to said cherrypicker multiplexers being ones which will carry the video programs and other data requested in the upstream requests;

and wherein said packet switch functions to receive said LAN packets or messages identifying the requested LAN packets and generates and sends LAN packets or other messages to said one or more video servers and/or satellite uplink/downlink circuitry requesting that the requested data be transmitted to said IP wrapper circuit.

16. (Original) The apparatus of claim 15 further comprising an IP dewrapper circuit coupled to said packet switch via said local area network and functioning to receive LAN packets encapsulating UDP/IP or TCP/IP packets encapsulating MPEG data and strip off said LAN packet header and said UDP/IP packet header and output a pure MPEG transport stream, and wherein said cherrypicker multiplexers address said UDP/IP or TCP/IP packets to said IP dewrapper circuit and further function to encapsulate said UDP/IP or TCP/IP packets into LAN packets addressed to said IP dewrapper circuit.

17. (Previously presented) An apparatus comprising:

one or more video servers and/or satellite uplink/downlink circuitry that output MPEG transport streams encoding one or more video programs, each MPEG transport stream comprised of a plurality of MPEG packets each having a program identification code (hereafter PID);

one or more web servers coupled to the internet;

an IP wrapper circuit for receiving MPEG transport streams on one or more inputs coupled to said one or more video servers and/or satellite receivers, and mapping said PIDs and input number for each MPEG packet in each said transport stream into an IP packet header multicast destination address and encapsulating one or more of said MPEG packets having the same PID and input number into an IP packet and encapsulating each IP packet into a LAN packet having an LAN packet destination address which is a multicast address but which is unique to the PID and input number of the MPEG packets enclosed therein;

a local area network coupled to said IP wrapper circuit and said one or more web servers;

a packet switch coupled to said IP wrapper circuit and said one or more web servers via said local area network;

one or more cherrypicker multiplexers coupled to said packet switch via said local area network, each functioning to receive data defining which programs have been requested by one or more customers or which is to be transmitted regardless of requests for it and generating and transmitting to said packet switch one or more packets identifying by LAN packet destination address the LAN packets said packet switch is to route to said cherrypicker multiplexer, and for receiving from said packet switch the requested LAN packets encapsulating MPEG data and assembling MPEG transport streams that are to be sent to said customers containing data encoding the programs which have been requested or which are to be transmitted regardless of request, and encapsulating MPEG packets from said transport streams into UDP/IP or TCP/IP packets addressed either to a host computer and a process on said host computer at a customer site to which said data is to be sent or addressed to an IP dewrapper circuit coupled by said local area network to said packet switch and which does not form part of the invention of this claim;

means for receiving upstream requests for video-on-demand programs or other TCP/IP packetized data from the internet or other sources and for transmitting those requests to said cherrypicker multiplexers;

and wherein said cherrypicker multiplexers convert said upstream requests to particular PIDs and input numbers or any format suitable for communicating to the source of the requested data what data was requested, and generate and send to said packet switch LAN packets or other messages identifying the particular TCP/IP data encapsulated in LAN packets and/or LAN packets encapsulating video program data to be routed to each said cherrypicker multiplexer, said LAN packets being identified by LAN destination address, said LAN packet to be routed to said cherrypicker multiplexers being ones which will carry the video programs and/or other TCP/IP packetized data requested in said upstream requests;

and wherein said packet switch functions to receive said LAN packets or messages identifying the requested LAN packets and generates and sends LAN packets or other messages to said one or more video servers and/or satellite uplink/downlink circuitry requesting that the requested video data be transmitted to said IP wrapper circuit and that the requested TCP/IP data be transmitted to said packet switch, said packet switch functioning to receive LAN packets

encapsulating the requested video and/or TCP/IP packetized data and route said LAN packets to the cherrypicker multiplexer that requested said data.

18. (Original) The apparatus of claim 17 further comprising an UP dewrapper circuit coupled to said packet switch via said local area network and functioning to receive LAN packets encapsulating UDP/IP or TCP/IP packets encapsulating MPEG data and strip off said LAN packet header and said UDP/IP packet header and output a pure MPEG transport stream, and wherein said cherrypicker multiplexers address said UDP/IP or TCP/IP packets to said IP dewrapper circuit and further function to encapsulate said UDP/IP or TCP/IP packets into LAN packets addressed to said IP dewrapper circuit.

19. (Previously presented) A process for supplying video data to consumers, comprising the steps of:

(1) receiving one or more MPEG transport streams containing data encoding video programs to be transmitted to one or more consumers, each MPEG transport stream comprised of a plurality of MPEG packets each having a program identification code (hereafter PID);

(2) encapsulating one or more MPEG packets having the same PID from said transport streams in the payload portion of an internet protocol packet (hereafter referred to as an IP packet) and mapping the PID of the encapsulated MPEG packets into an IP multicast address used as the destination address of said IP packet;

(3) encapsulating each said IP packet in a local area network packet and mapping said IP packet multicast destination address into a multicast destination address for the local area network destination address which is unique for each PID;

(4) transmitting said local area network packets so generated over said local area network to a packet switch;

(5) receiving in said packet switch from each of said one or more cherrypicker multiplexers one or more local area network packets containing data indicating the video program data to be routed to said cherrypicker multiplexer and routing incoming local area network packets containing data specified by a cherrypicker multiplexer as desired data to said cherrypicker multiplexer;

(6) in each cherrypicker multiplexer, sorting incoming MPEG packets by their PIDs into one or more MPEG transport streams to be transmitted to one or more customers and packetizing each MPEG transport stream into TCP/IP or UDP/IP packets.

20. (Previously presented) The process of claim 19 wherein step (5) includes at least receiving at said packet switch cherrypicker multiplexer one or more local area network packets containing data indicating video-on-demand program data which has been requested by one or more customers being served by said cherrypicker multiplexer, and wherein step (6) further comprises packetizing MPEG packets from each MPEG transport stream encoding a video-on-demand program which has been requested by a customer in TCP/IP or UDP/IP packets addressed to a host computer and a particular process executing on said host computer which requested said video-on-demand program.

21 (Original) The process of claim 19 wherein step (5) includes at least receiving from each cherrypicker multiplexer one or more local area network packets containing data indicating video program data which has been requested by one or more customers being served by said cherrypicker multiplexer, and wherein step (6) further comprises packetizing MPEG packets from each MPEG transport stream encoding a video-on-demand program which has been requested by a customer in TCP/IP or UDP/IP packets addressed to an MPEG transport stream generating process in one of one or more IP dewrapper circuits which transmits MPEG transport streams to customers, the particular IP dewrapper circuit to which said TCP/IP or UDP/IP packets encoding a particular video-on-demand program are addressed being the one which transmits an MPEG transport stream to a customer which requested said video-on-demand program, and further comprising the step of encapsulating packets dewrapper circuit.

22. (Original) The process of claim 21 further comprising stripping off the local area network packet headers and TCP/IP or UDP/IP packet headers from said local area network packets encapsulating the MPEG packets which encode a particular video-on-demand program and transmitting said MPEG packets to the customer which requested said video-on-demand program

as an MPEG transport stream which is modulated in any way and multiplexed, if necessary, in any way onto any suitable downstream logical and physical channel.

23 (Previously presented) The process of claim 19 wherein step (6) further comprises the steps of:

receiving data indicating the available bandwidth for MPEG packets encoding particular video programs;

decompressing at least partially the MPEG packets received in each cherrypicker multiplexer;

recompressing the video data from MPEG packets encoding each particular video program to the available bandwidth specified for that particular video program; and

repacketizing the video data into MPEG packets in an MPEG transport stream.

24. (Original) The process of claim 20 wherein step (6) further comprises the steps of:

receiving data indicating the available bandwidth for MPEG packet encoding particular video programs;

decompressing at least partially the MPEG packets received in each cherrypicker multiplexer;

recompressing the video data from MPEG packets encoding each particular video program to the available bandwidth specified for that particular video program; and

repacketizing the video data into MPEG packets in an MPEG transport stream.

25. (Original) The process of claim 21 wherein step (6) further comprises the steps of:

receiving data indicating the available bandwidth for MPEG packet encoding particular video programs;

decompressing at least partially the MPEG packets received in each cherrypicker multiplexer;

recompressing the video data from MPEG packets encoding each particular video program to the available bandwidth specified for that particular video program; and

repacketizing the video data into MPEG packets in an MPEG transport steam.

26. (Previously presented) The process of claim 22 wherein step (6) further comprises the steps of:

receiving data indicating the available bandwidth for MPEG packet encoding particular video programs;

decompressing at least partially the MPEG packets received in each cherrypicker multiplexer;

recompressing the video data from MPEG packets encoding each particular video program to the available bandwidth specified for that particular video program; and

repacketizing the video data into MPEG packets in an MPEG transport stream.

27. (Previously presented) A process for supplying video data to consumers, comprising the steps of:

(1) receiving one or more MPEG transport streams containing data encoding video programs to be transmitted to one or more consumers, each MPEG transport stream comprised of a plurality of MPEG packets each having a program identification code (hereafter PID);

(2) encapsulating one or more MPEG packets having the same PID and input multiplex number (together hereafter referred to as a combined PID) from said transport streams in the payload portion of an internet protocol packet (hereafter referred to as an IP packet) and mapping the combined PID of the encapsulated MPEG packets into an IP multicast address used as the destination address of said IP packet;

(3) encapsulating each said IP packet in a local area network packet and mapping said IP packet multicast destination address into a multicast destination address for the local area network destination address which is unique for each combined PID;

(4) transmitting said local area network packets so generated over said local area network to a packet switch;

(5) receiving in said packet switch from each of said one or more cherrypicker multiplexers one or more local area network packets containing data indicating the video-on-demand program data which has been requested by one or more customers and which is to be routed to said cherrypicker multiplexer and routing incoming local area network packets

containing data specified by a cherrypicker multiplexer as desired data to said cherrypicker multiplexer;

(6) in each cherrypicker multiplexer, sorting incoming MPEG packets by their combined PIDs into one or more MPEG transport streams to be transmitted to one or more customers and further comprising the steps of packetizing MPEG packets from each MPEG transport stream encoding a video-on-demand program which has been requested by a customer in TCP/IP or UDP/IP packets addressed to an MPEG transport stream generating process in one of one or more IP dewrapper circuits which transmit MPEG transport streams to customers, the particular IP dewrapper circuit to which said TCP/IP or UDP/IP packets encoding a particular video-on-demand program are addressed being the one which transmits an MPEG transport stream to a customer which requested said video-on-demand program, and further comprising the step of encapsulating said TCP/IP or UDP/IP packets in a local area network packet addressed to said IP dewrapper circuit;

(7) stripping off the local area network packet headers and TCP/IP or UDP/IP packet headers from said local area network packets encapsulating the MPEG packets which encode a particular video-on-demand program and transmitting said MPEG packets to the customer which requested said video-on-demand program as an MPEG transport stream which is modulated in any way and multiplexed, if necessary, in any way onto any suitable downstream logical and physical channel;

(8) and wherein step (6) further comprises the steps of:
receiving data indicating the available bandwidth for MPEG packet encoding particular video programs;

decompressing at least partially the MPEG packets received in each cherrypicker multiplexer;

recompressing the video data from MPEG packets encoding each particular video program to the available bandwidth specified for that particular video program; and

repacketizing the video data into MPEG packets in an MPEG transport stream.

28. (Previously presented) A process carried out at a headend having video servers coupled thereto for supplying video data from video servers coupled to said headend and iData to

consumers, wherein iData is defined as data from one or more web or other servers coupled to said headend other than said video servers coupled to said headend, comprising the steps of:

- (1) in a modem coupled to one or more customers by any upstream and downstream data paths, receiving upstream video-on-demand requests and requests for iData and iData command packets, packetizing said requests and commands into local area network packets (hereafter LAN packets) and transmitting LAN packets containing requests for iData and other commands via a local area network to an appropriate server entity which can supply the requested iData or execute the iData command, and transmitting LAN packets containing video-on-demand requests to one or more cherrypicker multiplexers;
- (2) simultaneously or at different times, receiving in an IP dewrapper circuit one or more MPEG transport streams containing data encoding video programs to be transmitted to one or more consumers, each MPEG transport stream comprised of a plurality of MPEG packets each having a program identification code (hereafter PID);
- (3) receiving or generating in a web server connected to the internet or any other type of server including an application server one or more TCP/IP or UDP/IP packets of iData and encapsulating them in local area network packets addressed to a modem which will be used to transmit the TCP/IP or UDP/IP packets encapsulated in said LAN packets downstream and transmitting said LAN packets to a packet switch;
- (4) in said packet switch routing said LAN packets containing iData to said modem;
- (5) in said modem, receiving said LAN packets containing iData and transmitting them downstream to the customer which requested said iData;
- (6) in an IP wrapper circuit, encapsulating one or more MPEG packets of video program data having the same PID and input multiplex number (together hereafter referred to as a combined PID) from said transport streams in the payload portion of an internet protocol packet (hereafter referred to as an IP packet) and mapping the said combined PID of the encapsulated MPEG packets into an IP multicast address used as the destination address of said IP packet;
- (7) in said IP wrapper circuit encapsulating each said IP packet in a LAN packet and mapping said IP packet multicast destination address into a multicast destination address for the local area network destination address which is unique for each said combined PID;

(8) transmitting said LAN packets so generated containing video program data over said local area network to a packet switch;

(9) receiving in said packet switch from each of said one or more cherrypicker multiplexers one or more LAN packets containing data indicating the video program data to be routed to said cherrypicker multiplexer and routing incoming LAN packets containing data specified by a cherrypicker multiplexer as desired data to said cherrypicker multiplexer;

(10) in each cherrypicker multiplexer, receiving data indicating video-on-demand requests for video programs and transmitting data to said packet switch indicating which LAN packets containing video program data to route to said cherrypicker multiplexer, and sorting incoming MPEG packets by their combined PIDs into one or more MPEG transport streams to be transmitted to one or more customers and performing the following steps:

decompressing at least partially the MPEG packets received in each cherrypicker multiplexer;

recompressing the video data from MPEG packets encoding each particular video program to the available bandwidth specified for that particular video program; and

repacketizing the video data into MPEG packets and packetizing said MPEG packets in TCP/IP or UDP/IP packets.

29. (Previously presented) The process of claim 28 wherein said TCP/IP or UDP/IP packets generated by said cherrypicker multiplexer are addressed to a host computer and process executing on said host computer at a customer location to which the data encapsulated in said TCP/IP or UDP/IP packets is to be sent, and further comprising the step of transmitting said TCP/IP or UDP/IP packets to said host computer and process executing on said host over any downstream logical channel which has TCP/IP or UDP/IP connectivity all the way to said host computer and process running on said host computer.

30. (Previously presented) The process of claim 28 wherein said TCP/IP or UDP/IP packets generated by said cherrypicker multiplexer are addressed to an IP dewrapper circuit, and further comprising the steps of:

encapsulating said TCP/IP or UDP/IP packets in local area network packets addressed to said IP dewrapper circuit;

in said IP dewrapper circuit, receiving said LAN packets and stripping off the LAN packet headers and TCP/IP or UDP/IP packet headers and assembling the encapsulated MPEG packets into MPEG transport streams;

transmitting said MPEG transport streams to specific customers over logical channels on any suitable downstream medium; and

if said MPEG video data contains video-on-demand video program data for which a host computer and a process executing on said host computer at the customer location which requested the video program does not have data regarding which logical channel said requested video program data will be transmitted on and/or what PID the video program data will have, transmitting a downstream message to said host computer and said process executing on said host computer which requested said video program data indicating which logical channel said video program will be transmitted on and, if necessary, what PID or PIDs said requested video program data will have.

31. (Previously presented) A process video carried out at a headend having video servers coupled thereto, said process for supplying video data to consumers, comprising the steps of:

(1) in a modem coupled to one or more customers by any upstream and downstream data paths, receiving upstream video-on-demand requests and requests for iDatas, wherein iData is defined as data from one or more web or other servers coupled to said headend other than said video servers coupled to said headend; packetizing said requests into local area network packets (hereafter LAN packets) and transmitting LAN packets containing each request for iData via a local area network to an appropriate server entity which can supply the requested iData along with message data indicating to which of one or more cherrypicker multiplexers to transmit the requested iData, and transmitting LAN packets containing video-on-demand requests to one or more cherrypicker multiplexers;

(2) receiving in an IP dewrapper circuit one or more MPEG transport streams containing data encoding video programs to be transmitted to one or more consumers, each

MPEG transport stream comprised of a plurality of MPEG packets each having a program identification code (hereafter PID);

(3) receiving or generating in web server connected to the internet or any other type of server including an application server one or more TCP/IP or UDP/IP packets of iData and encapsulating them in network packets (hereafter network packets) addressed to one or more cherrypicker multiplexers at least one of which will be used to transmit said iData packets downstream in an MPEG transport stream, and transmitting said network packets to a packet switch;

(4) in said packet switch, routing said network packets containing iData to a cherrypicker multiplexer;

(5) in each said cherrypicker multiplexer, receiving said network packets containing iData and recovering iData stored therein;

(6) in an IP wrapper circuit, encapsulating one or more MPEG packets of video program data having the same PID and input multiplex number (together hereafter referred to as a combined PID) from said transport streams in the payload portion of an internet protocol packet (hereafter referred to as an IP packet) and mapping the combined PID of the encapsulated MPEG packets into an IP multicast address used as a destination address of said IP packet;

(7) in said IP wrapper circuit, encapsulating each said IP packet in a LAN packet and mapping said IP packet multicast destination address into a local area network destination address which is unique for each said combined PID and placing said local area network destination address in said LAN packet;

(8) transmitting said LAN packets so generated containing video program data over said local area network to a packet switch;

(9) receiving in said packet switch from each of said one or more cherrypicker multiplexers one or more LAN packets containing data indicating which LAN packets containing said video program data or iData are to be routed to said cherrypicker multiplexer and routing incoming LAN packets containing the specified data to said cherrypicker multiplexer;

(10) in each cherrypicker multiplexer, receiving VOD request data indicating video-on-demand requests for video programs made by customers and transmitting LAN packets containing said VOD request data to said packet switch indicating which LAN packets

containing video-on-demand program data to route to said cherrypicker multiplexer, and sorting incoming LAN packets arriving from said packet switch and containing MPEG packets containing video data by a PID in each MPEG packet or by local area network station addresses in said incoming LAN packets, each of said local area network station addresses being mapped to a PID in an MPEG packet encapsulated in said LAN packet, said sorting resulting in one or more pluralities of LAN packets containing MPEG packet data from which one or more MPEG transport streams to be transmitted to one or more customers can be created, and performing the following steps:

recovering MPEG packets encapsulated in said LAN packets and decompressing at least partially the MPEG packets received in each cherrypicker multiplexer;

recompressing the data from MPEG packets encoding each particular video program and iData to the available bandwidth specified for that particular video program or iData; and

repacketizing the video data and iData into MPEG packets and packetizing said MPEG packets in TCP/IP or UDP/IP packets.

32. (Previously presented) The process of claim 31 wherein said TCP/IP or UDP/IP packets generated by each said cherrypicker multiplexer are addressed to a host computer and process executing on said host computer at a customer location to which the video data or iData encapsulated in said TCP/IP or UDP/IP packets is to be sent, and further comprising the step of transmitting said TCP/IP or UDP/IP packets to said host computer and process running on said host computer over any downstream logical channel which has TCP/IP or UDP/IP connectivity all the way to said host computer and process running on said host computer.

33. (Previously presented) The process of claim 31 wherein said TCP/IP or UDP/IP packets generated by said cherrypicker multiplexer are addressed to an IP dewrapper circuit, and further comprising the steps of:

encapsulating said TCP/IP or UDP/IP packets in LAN packets addressed to said IP dewrapper circuit;

in said IP dewrapper circuit, receiving said LAN packets and stripping off the LAN packet headers and TCP/IP or UDP/IP packet headers and assembling the encapsulated MPEG packets into MPEG transport streams;

transmitting said MPEG transport streams to specific customers over logical channels on any suitable downstream medium; and

if said MPEG video data contains video-on-demand video program data for which the host and process at the customer location which requested the video program does not have data regarding which logical channel said requested video program data will be transmitted on and/or what PID the video program data will have, transmitting a downstream message to a host computer and a process running on said host computer which requested said video program data indicating which logical channel said video program will be transmitted on and, if necessary, what PID or PIDs said requested video program data will have.

34. (Previously presented) A process carried out at a headend having video servers coupled thereto, said process for supplying video data to consumers, comprising the steps for:

- (1) in a modem coupled to one or more customers by any upstream, receiving upstream video-on-demand requests and requests for iData and iData commands wherein iData is defined as data from one or more web or other servers other than said video servers coupled to said headend, and transmitting them to a control computer;
- (2) in said control computer transmitting one or more messages to one or more video servers, web servers and/or application servers that can supply the requested data requesting that they supply the requested data and assigning logical channels on which the requested iData and video program data is to be transmitted to the customer and generating downstream messages to be sent to each customer telling the customer which logical channel upon which the data said customer requested will be found;
- (3) transmitting the requested iData and video program data and downstream message data to one or more cherrypicker multiplexers; and
- (4) in each cherrypicker multiplexer, adjusting the bandwidth of the video data and/or the iData if necessary and repacketizing said video data and iData and downstream message data

in MPEG packets and transmitting said MPEG packets to the customer who requested the data via an MPEG transport stream.

35. (Previously Presented) A process carried out in a headend coupled to one or more video servers, said process for supplying video data and iData to consumers, wherein iData is defined as data from one or more web or other servers other than said video servers coupled to said headend, comprising the steps of:

(1) in a modem coupled to one or more customers by any upstream, data path and any downstream data path compatible with said modem, receiving upstream video-on-demand requests and requests for iData and iData commands and transmitting them to a control computer, and receiving downstream iData and downstream command and control messages, both said downstream iData and said command and control messages encapsulated in TCP/IP or UDP/IP packets addressed to a host computer and one or more processes running on said host computer at a customer at a customer location, and transmitting said downstream iData and command and control messages to said customer to which it is addressed over said downstream data path;

(2) in said control computer transmitting one or more messages to one or more video servers, web servers and/or application servers that can supply the requested video data and iData requesting that they supply the requested video data and iData and assigning logical channels on which the requested video program data is to be transmitted to the customer and generating downstream command and control messages to be sent to each customer telling the customer which logical channel upon which the video-on-demand data said customer requested will be found;

(3) transmitting the requested video program data to one or more cherrypicker multiplexers; and

(4) in each cherrypicker multiplexer, adjusting the bandwidth of the video data of each video program if necessary to a smaller bandwidth and repacketizing said video data in MPEG packets and transmitting said MPEG packets to the customer who requested the data via an MPEG transport stream.

36. (Previously presented) The process of claim 35 wherein said modem is a Data Over Cable Service Interface Specifications (hereafter DOCSIS) compliant cable modem and said upstream and downstream data paths are hybrid fiber coaxial cable plants.

37. (Previously presented) The process of claim 35 wherein said modem is one or more digital subscriber line modems, and said upstream and downstream data paths are digital subscriber lines.

38. (Previously presented) The process of claim 35 wherein said modem is comprised of a conventional telephone line modem receiver for receiving upstream data and commands from a customer and a downstream circuit for delivery of data and commands downstream to a customer using a satellite transmitting to a satellite antenna and satellite receiver at a customer premises where said satellite antenna and satellite receiver at the customer premises are not part of the invention, said downstream circuit of said modem comprising a satellite uplink transmitter and a satellite transponder for transmitting said downstream data to a satellite for transmission downstream to said customer via satellite transponder, and wherein said upstream data path is a conventional POTS telephone line.

39. (Previously presented) A process carried out in a headend coupled to one or more video servers, said process for supplying video data to consumers, comprising the steps of:

(1) in a modem coupled to one or more customers by any upstream and any downstream data path, receiving upstream video-on-demand requests and requests for iData and iData commands and transmitting them to a control computer wherein iData is defined as data from one or more web or other servers other than said video servers coupled to said headend, and receiving downstream command and control messages from said control computer and transmitting them to customers over said downstream data path via said modem;

(2) in said control computer transmitting one or more messages to one or more video servers, web servers and/or application servers that can supply the requested data requesting that they supply the requested video data and iData and assigning logical channels on which the requested iData and video program data is to be transmitted to the customer and generating

downstream command and control messages to be sent to each customer telling the customer which logical channel upon which the iData and video program data said customer requested will be found;

(3) transmitting the requested iData and video program data to one or more cherrypicker multiplexers; and

(4) in each cherrypicker multiplexer, adjusting the bandwidth of the video data and/or the iData, if necessary, to a smaller bandwidth, and repacketizing said video data and iData in MPEG packets and transmitting said MPEG packets to the one or more customer who requested the data via one or more logical channels as one or more MPEG transport streams.

40. (Previously presented) The process of claim 39 wherein said modem is a Data Over Cable Service Interface Specifications (hereafter DOCSIS) compliant cable modem and said upstream and downstream data paths are hybrid fiber coaxial cable plants.

41. (Previously presented) The process of claim 39 wherein said modem is one or more digital subscriber line modems, and said upstream and downstream data paths are digital subscriber lines.

42. (Previously presented) The process of claim 39 wherein said modem is comprised of a conventional telephone line modem receiver for receiving upstream data and commands from a customer and a downstream circuit for delivery of data and commands downstream to a customer using a satellite transmitting to a satellite antenna and satellite receiver at a customer premises where said satellite antenna and satellite receiver at the customer premises are not part of the invention, said downstream circuit of said modem comprising a satellite uplink transmitter and a satellite transponder for transmitting said downstream data to a satellite for transmission downstream to said customer via said satellite transponder, and wherein said upstream data path is a conventional POTS telephone line.